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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/386,646	08/31/1999	PIERRE C. FAZAN	660073.488D1	1639

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EXAMINER
VU, HUNG K

ART UNIT	PAPER NUMBER
2811	

DATE MAILED: 07/01/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/386,646	Applicant(s) FAZAN ET AL.	
	Examiner Hung K. Vu	Art Unit 2811	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 April 2002* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *22 and 24-37* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *22,24-37* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *21* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 22 and 24-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Park et al. (PN 5,296,400, of record) in view of Poppert et al. (PN 4,593,459, of record).

Park et al. discloses, as shown in Figures 1F and 2H, a microelectronic device comprising,

a microelectronic substrate (1);

a gate structure including a gate oxide layer (4) formed on the substrate, a first gate layer (lower portion of 5) formed on the gate oxide layer, and an adhesion layer (upper portion of 5) formed on the first gate layer, the gate structure having a field oxide layer (3) at least partially disposed therein and extending into the substrate;

the field oxide layer not contact the gate oxide layer, the field oxide layer having a field oxide level between the level of the upper surface of the substrate and the level of an upper surface of the first gate layer.

a component formed on the field oxide, the component extending from the field oxide by a height at least equal to approximately two times a height that the field oxide extends from the surface of the substrate;

further comprising an oxide spacer (7) adjacent the component.

Park et al. discloses the field oxide is a LOCOS. Park et al. does not disclose the field oxide is a trench isolation. However, Poppert et al. discloses a microelectronic device comprising a trench isolation (46,47). Note Figure 10 of Poppert et al.. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the field oxide of Park et al. by trench isolation, such as taught by Poppert et al. in order to prevent the bird-beak effect and further isolate the devices from each others.

With regard to claims 24-25, Park et al. and Poppert et al. do not disclose the structure further comprising a silicide layer formed on the adhesion layer. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form a silicide layer on the adhesion layer because this structure reduces the contact resistance.

With regard to claim 35, Park et al. does not disclose the first gate layer comprise a polysilicon layer. However, Poppert et al. discloses the first gate layer (53,54) comprise a polysilicon layer. Note Figure 10 of Poppert et al.. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the first gate layer of Park et al. comprises a polysilicon layer, such as taught by Poppert et al. because polysilicon is commonly and easy to form as the gate layer.

2. Claim 22, 24, 25, 28, 29, and 32-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Noguchi et al. (PN 4,935,802, of record) in view of Poppert et al. (PN 4,593,459, of record).

Noguchi et al. discloses, as shown in Figures 1 and 4, a microelectronic device comprising,

a microelectronic substrate (11);

a gate structure including a gate oxide layer formed on the substrate, a first gate layer formed on the gate oxide layer, and an adhesion layer formed on the first gate layer, and a conductive layer formed on the adhesion layer;

the field oxide layer extending beyond the surface of the substrate by a height which is less than or equal to approximately one half of a height of the gate structure formed on the substrate, the field oxide layer not contact the gate oxide layer and not extending laterally over the surface of the substrate.

Noguchi discloses the field oxide is a LOCOS. Noguchi et al. does not disclose the field oxide is a trench isolation. However, Poppert et al. discloses a microelectronic device comprising a trench isolation (46,47). Note Figure 10 of Poppert et al.. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the field oxide of Noguchi et al. by trench isolation, such as taught by Poppert et al. in order to prevent the bird-beak effect and further isolate the devices from each others.

With regard to claims 24, Noguchi et al. and Poppert et al. do not disclose the conductive layer is a silicide layer. However, it would have been obvious to one of ordinary skill in the art at the

time the invention was made to form the conductive layer of Noguchi et al. and Poppert et al. as a silicide layer in order to reduce the contact resistance.

With regard to claims 29, 31, and 33, Noguchi et al. does not disclose an oxide spacer adjacent the gate structure. However, Poppert et al. discloses an oxide spacer (62) adjacent the gate structure. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the gate structure of Noguchi et al. having an oxide spacer, such as taught by Poppert et al in order to protect the gate and the source/drain region from short-circuit.

With regard to claim 35, Noguchi et al. and Poppert et al. the first gate layer comprises a polysilicon layer.

Response to Arguments

3. Applicant's arguments filed 04/11/02 have been fully considered but they are not persuasive.

It is argued, at pages 7-16 of the Remarks, that the combination of Park et al. and Poppert et al., as well as the combination of Noguchi et al. and Poppert et al., does not disclose a field oxide layer having sides that are substantially straight and substantially parallel from a bottom of the trench to a top surface of the field oxide layer because Poppert et al. teaches the silicon dioxide portions 40 are engaged with the silicon dioxide region 48 and extend outwardly over the sides of the trench 46. This argument is not convincing because Poppert et al. clearly teaches, as shown in Figure 10, a field oxide layer (48) having sides that are substantially straight and

substantially parallel from a bottom of the trench (46) to a top surface of the field oxide layer, and that the field oxide layer (48) does not extend outwardly over the sides of the trench (46). Note that layer 40 is not a part of the field oxide layer 48.

It is argued, at pages 7-16 of the Remarks, that Poppert et al. does not teach the field oxide layer does not extend laterally from the trench over the upper surface of the substrate, does not contact the gate oxide layer, and extends upwardly from the trench to a field oxide level between the level of the upper surface of the substrate and the level of an upper surface of the first gate layer. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Park et al. and Noguchi et al. disclose a field oxide layer is a LOCOS. However, it is well known that LOCOS normally produces the bird-beak effect and does not provide good isolation between the devices. Trench isolation has been used to overcome those

problems. Therefore, one skill in the art would be motivated to use the trench isolation, such as taught by Poppert et al. in place of LOCOS in order to prevent bird-beak effect and to further provide a better isolation between the devices.

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

Conclusion

4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Papers related to this application may be submitted to Technology Center (TC) 2800 by facsimile transmission. Papers should be faxed to TC 2800 via the TC 2800 Fax center located in Crystal Plaza 4, room 4-C23. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The Group 2811 Fax Center number is (703) 308-7722 and 308-7724. The Group 2811 Fax Center is to be used only for papers related to Group 2811 applications.

Any inquiry concerning this communication or any earlier communication from the Examiner should be directed to ***Hung Vu*** whose telephone number is **(703) 308-4079**. The Examiner is in the Office generally between the hours of 7:00 AM to 5:30 PM (Eastern Standard Time) Monday through Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, ***Tom Thomas***, can be reached on **(703) 308-2772**.

Any inquiry of a general nature or relating to the status of this application should be directed to the **Technology Center Receptionists** whose telephone number is **(703) 308-0956**.

Vu

June 26, 2002

Tom Thomas

TOM THOMAS
SUPERVISORY PATENT EXAMINER
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